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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/364,786	07/30/1999	Radhika Thekkath	0077.20	9876

7590   11/04/2004

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EXAMINER
CHUNG, DANIEL J

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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	Application No.	Applicant(s)
Office Action Summary	09/364,786	THEKKATH ET AL.
	Examiner	Art Unit	
	Daniel J Chung	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 July 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claims 1-41 are presented for examination. This office action is in response to

the Amendment filed on 7-12-2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Koss et al (5,720,019) in view of Inoue et al (5,982,380), and further in view of

Heinrich ("MIPS R4000 Microprocessor User's Manual).

Regarding claim 1, Koss et al discloses that the claimed feature of a method for

performing computer graphics calculations, method comprising: representing [i.e. steps

302,304 in Fig 10] a vertex in a computer graphics image with a plurality of coordinates

["vertex coordinates"] (See col 11 line 30-31, col 11 line 61-62, Fig 8-9, [420,424,426] in

Fig 11); transforming plurality of coordinates into a plurality of transformed coordinates

["transformed coordinates] (See col 11 line 17-20, col 11 line 27-32, col 11 line 50-60);

using a floating point magnitude compare [i.e. "comparator", "floating point comparator",

"magnitude comparator"; 206,208,213] instruction to perform a magnitude comparison

of absolute values between at least a portion of plurality of transformed coordinates and

a value representing a plurality of edges of a specified view volume, wherein

comparison results for at least three view volume edges are obtained. (See col 2 line

42, col 3 line 28-39, Fig 5, Fig 6, col 8 line 27-col 9 line 37, col 11 line 67-col 12 line 3)

Koss et al does not specifically disclose that performing a magnitude comparison

of absolute values. However, Inoue et al teaches the hardware clipping device, which

compares objects with boundaries via use of **absolute values**. (See Title, col 2 line 20-

40, col 4 line 55-col 5 line 13, col 6 line 52-67) It would have been obvious to one

skilled in the art to incorporate the teaching of Inoue et al into the teaching of Koss et al,

in order to operating the clipping process efficiently, as such improvement is also

advantageously desirable in the teaching of Koss et al for operating the rendering

system with optimization. Furthermore, it is noted that the values inputted into the

"comparator" of Koss et al can be also considered as "absolute values" of recited claim,

since the magnitude comparison result is always positive number.

Also, Koss et al does not explicitly disclose that utilizing the set of compare

instructions. However, such limitation is shown in the teaching of Heinrich. ["the

floating-point compare (C.fmt.cond) instructions interpret the contents of two FPU

registers (fs, ft) in the specified format (fmt) and arithmetically compare them"] (See

p.171, Table 6-12, B-19) it would have been obvious to one skilled in the art to

incorporate the teaching of Heinrich into the teaching of Koss et al, in order to allow the

processor for directly performing the specific calculations and operations during graphic

rasterization, as such improvement [implementing "compare instructions"] is also

advantageously desirable in the teaching of Koss et al for operating the rendering

system with optimization.

Regarding claim 2, Koss et al discloses that plurality of transformed coordinates

are processed in parallel. (See fig 3-4, Fig 8-9, col 2 line 34-51, col 6 line 66-col 7 line

17, col 15 line 56-58)

Regarding claim 3, refer to the discussion for the claim 1 hereinabove, Heinrich

further discloses that setting a plurality of condition code bits to one or more specific

states to indicate results of magnitude comparison. (See p.159, p.161, p.170; Also See

col 2 line 30-51, col 8 line 43-col 9 line 50, col 11 line 61-col 12 line 10 in Koss)

Regarding claim 4, refer to the discussion for the claim 1 hereinabove, Heinrich

further discloses that specifying a compare condition in floating point magnitude

compare instruction. (See p.159, p.161, p.170)

Regarding claim 5, refer to the discussion for the claim 1 hereinabove, Heinrich

further discloses that setting one of plurality of condition code bits to indicate true if an

associated compare condition is true and setting one condition code bit to indicate false if associated compare condition is false. (See p.159, p.161, p.170)

Regarding claim 6, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that converting a plurality of fixed point values into a plurality of floating point values using a first convert instruction. (See p.170, B-10)

Regarding claim 7, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that first convert instruction is a CVT.PS.PW instruction. (See B-9, B-10)

Regarding claim 8, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that converting a plurality of floating point values into a plurality of fixed point values using a second convert instruction. (See p.170, B-10, B-21, B-23)

Regarding claim 9, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that second convert instruction is a CVT.PS.PW instruction. (See B-9, B-10)

Regarding claim 10, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that floating point magnitude compare instruction is a CABS instruction. (See p.171, B-9, B-10, B-19)

Regarding claim 11, claim 11 is similar in scope to the claims 1, and thus the rejection to claim 1 hereinabove is also applicable to claim 11. In addition, discloses that a bus; an instruction dispatch unit coupled to bus, instruction dispatch unit for dispatching instructions to a floating point unit; and floating point unit coupled to bus, floating point unit for executing instructions to implement a method for performing computer graphics calculations. (See Fig 3, Fig 4)

Regarding claim 12, claim 12 is similar in scope to the claim 3, and thus the rejection to claim 3 hereinabove is also applicable to claim 12.

Regarding claim 13, claim 13 is similar in scope to the claim 4, and thus the rejection to claim 4 hereinabove is also applicable to claim 13.

Regarding claim 14, claim 14 is similar in scope to the claim 5, and thus the rejection to claim 5 hereinabove is also applicable to claim 14.

Regarding claim 15, claim 15 is similar in scope to the claim 6, and thus the rejection to claim 6 hereinabove is also applicable to claim 15.

Regarding claim 16 claim 16 is similar in scope to the claim 7, and thus the rejection to claim 7 hereinabove is also applicable to claim 16.

Regarding claim 17, claim 17 is similar in scope to the claim 8, and thus the rejection to claim 8 hereinabove is also applicable to claim 17.

Regarding claim 18, claim 18 is similar in scope to the claim 9, and thus the rejection to claim 9 hereinabove is also applicable to claim 18.

Regarding claim 19, claim 19 is similar in scope to the claim 10, and thus the rejection to claim 10 hereinabove is also applicable to claim 19.

Regarding claim 20, claim 20 is similar in scope to the claims 11, and thus the rejection to claim 11 hereinabove is also applicable to claim 20.

Regarding claim 21, claim 21 is similar in scope to the claim 3, and thus the rejection to claim 3 hereinabove is also applicable to claim 21.

Regarding claim 22, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that first instruction is part of a general purpose instruction set architecture. (See p.159, p.161, p.170, p.171)

Regarding claim 23, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that first instruction is part of an application specific extension to a general purpose instruction set architecture. (See p.159, p.161, p.170, p.171)

Regarding claim 24, Koss et al discloses that plurality of bits as set by first instruction indicate whether a graphics primitive will cross at least one edge of a view volume. (See Fig 3-4, Fig 8-10)

Regarding claim 25, Koss et al discloses that plurality of bits as set by first instruction indicate whether a graphics primitive will cross at least three edges of a view volume. (See Fig 3-4, Fig 8-10)

Regarding claim 26, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that first instruction is executed in a single clock cycle. (See p.159, p.161, p.170, p.171)

Regarding claim 27, claim 27 is similar in scope to the claim 20, and thus the rejection to claim 20 hereinabove is also applicable to claim 27.

Regarding claim 28, claim 28 is similar in scope to the claim 25, and thus the rejection to claim 25 hereinabove is also applicable to claim 28.

Regarding claim 29, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that plurality of operands are in a paired-single data format. (See p.159, p.161, p.170, p.171)

Regarding claim 30, claim 30 is similar in scope to the claim 20, and thus the rejection to claim 20 hereinabove is also applicable to claim 30.

Regarding claim 31, claim 31 is similar in scope to the claim 20, and thus the rejection to claim 20 hereinabove is also applicable to claim 31.

Regarding claim 32, claim 32 is similar in scope to the claim 20, and thus the rejection to claim 20 hereinabove is also applicable to claim 32.

Regarding claim 33, claim 33 is similar in scope to the claim 2, and thus the rejection to claim 2 hereinabove is also applicable to claim 33.

Regarding claim 34, claim 34 is similar in scope to the claim 21, and thus the rejection to claim 21 hereinabove is also applicable to claim 34.

Regarding claim 35, claim 35 is similar in scope to the claim 20, and thus the rejection to claim 20 hereinabove is also applicable to claim 35.

Regarding claim 36 claim 36 is similar in scope to the claim 22, and thus the rejection to claim 22 hereinabove is also applicable to claim 36.

Regarding claim 37, claim 37 is similar in scope to the claim 23, and thus the rejection to claim 23 hereinabove is also applicable to claim 37.

Regarding claim 38, claim 38 is similar in scope to the claim 1, and thus the rejection to claim 1 hereinabove is also applicable to claim 38.

Regarding claim 39, claim 39 is similar in scope to the claims 8 and 29, and thus the rejection to claims 8 and 29 hereinabove are also applicable to claim 39.

Regarding claim 40, claim 40 is similar in scope to the claim 29, and thus the rejection to claim 29 hereinabove is also applicable to claim 40.

Regarding claim 41, claim 41 is similar in scope to the claim 29, and thus the rejection to claim 29 hereinabove is also applicable to claim 41.

Response to Arguments/Amendments

Applicant's arguments, see Remarks p.15 line 2-5, filed on 7-12-2004, with respect to the rejection(s)of claim(s) 1 and 20 under 35 USC § 103 have been fully

considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of

Koss et al (5,720,019), Inoue et al (5,982,380), and further in view of Heinrich ("MIPS

R4000 Microprocessor User's Manual). Such new ground of rejection clearly shows

that the magnitude comparisons of absolute values, see the rejection hereinabove.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action. Any inquiry concerning this

communication or earlier communications from the examiner should be directed to

Daniel J. Chung whose telephone number is (703) 306-3419. He can normally be

reached Monday-Thursday and alternate Fridays from 7:30am- 5:00pm. If attempts to

reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael,

Razavi, can be reached at (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231
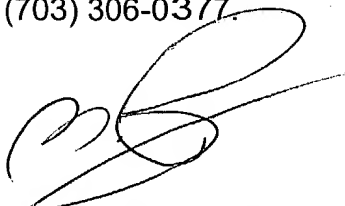
or faxed to:

(703) 872-9306 (Central fax)

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal

Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the Technology Center 2600 Customer Service Office

whose telephone number is (703) 306-0377.

djc
October 21, 2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600